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SPECIFICATION FOR FOG LIGHTS FOR AUTOMOBILES

(First Revision)

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NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR FOG LIGHTS FOR AUTOMOBILES

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0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 15 April 1977, after the draft finalized by the Automobile Electrical Equipment Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard was first published in 1969. This revision has been undertaken to upgrade its contents and bring in line with international practice as provided in uniform provisions concerning the Approval of Motors Vehicle Fog Lights, Regulations 19 of United Nations Economic Commission for Europe.

0.3 Fog lights are lighting devices which may be used with, or in lieu of, headlights to provide road illumination under conditions of rain, snow, dust or fog.

0.4 This standard covers the general requirements and methods of tests for checking electrical, mechanical and photometric properties of automobile fog lights.

0.5 Good performance of an automobile fog light depends on the care taken for proper installation in an appropriate manner. It is intended to cover under a separate code of practice which is under preparation, guidance to vehicle manufacturers on installation of head lights.

0.6 At present, all automobile lighting and signalling devices of motor vehicles have to meet the requirements of the rules and regulations made under the Motor Vehicle Act, 1939. However, these rules do not prescribe any qualitative requirement or methods of test for these devices. With a view to helping the manufacturers, users and the enforcing authority, a series of Indian Standards, of which this is the one, on automobile lighting and signalling devices is being prepared.

0.7 In preparing this standard, assistance has been derived from the following:

U. N. Regulations No. 19. Fog lights. United Nations Economic Commission for Europe.

SAE J 583 C Fog lamps. Society of Automotive Engineers, USA.

0.8 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the general requirements and methods of tests for checking electrical, mechanical and photometric properties of automobile fog lights.

2. TERMINOLOGY

2.0 For the purpose of this standard the following definitions shall apply.

2.1 Mounting Arrangements — The adjustable fixing components upon which the light unit is mounted in the fog light to facilitate focussing.

2.2 Retaining Ring — The clamping ring that holds the light unit.

2.3 Light Unit — A light unit comprises of lamp, lamp holder, reflector, lens and the retaining ring.

2.4 Proof (Used in Suffix) — Applies to a fitting which is so constructed, protected or treated that its satisfactory operation is not interfered with when subjected to the specified condition against which it has been proofed.

2.5 Routine Tests — Tests carried out on each equipment to check the requirements which are likely to vary during production.

2.6 Type Tests — Tests carried out to prove conformity with the specifications. These are intended to prove the general qualities and design of a given type of fog light.

2.7 Acceptance Tests – Tests carried out on sample taken from a lot for the purpose of acceptance of the lot.

3. MATERIAL, DESIGN, CONSTRUCTION AND WORKMANSHIP

3.1 The fog lights shall comply with the general requirements specified in **3.2** to **3.8** and those in IS : 3105-1966†.

*Rules for rounding off numerical values (*revised*).

†General requirements for automobile lighting and signalling devices.

3.2 Lens — The lens shall be free from cracks, wrinkles and such other defects which have an influence on the lighting characteristics and spoil the appearance obviously (*see also* IS : 6917-1973*).

3.3 Assembly — Assembly shall be satisfactory in all respects and specially dust and water-proof as in **5.1.8** and **5.1.9** of IS : 3105-1966†.

3.4 Body — The body of fog light shall be protected either by stove enamelling or by electroplating. If electroplated, it shall have Grade A finish according to IS : 1068-1968‡.

3.5 Reflector — They shall be bright finished after silver plating. Alternatively, the reflectors may be coated with aluminium by the process, known as aluminium vacuum deposition.

3.6 Gaskets — Gaskets used to seal movable parts shall be so designed or attached that they do not hinder or interfere in the case of reassembly in service when replacing a burnt out lamp. The material shall be water-proof and should be free from cracks and other defects.

3.7 Retaining and Mounting Group — Positive means shall be provided for holding the unit. The fastening means shall be deemed adequate if it is able to withstand and hold the unit securely in its proper position at the end of 25 replacements.

3.8 Connector — The voltage drop between the light unit contact and the connector at the end of 75 mm wire lead from the socket shall not exceed 40 milli-volts, with 10 ampere load.

4. ILLUMINATION OR PHOTOMETRIC REQUIREMENTS

4.1 Fog lights shall be so designed as to provide illumination with limited dazzle.

4.2 The illumination produced by the fog light shall be determined by means of a vertical screen set up 25 metres forward of the lens of the fog light. The point *HV* is the base of the perpendicular from the centre of the light to the screen. The line *hh* is the horizontal through *HV* (*see* Fig. 1).

4.3 In the case of type of construction other than a sealed beam type, a colourless bulb standard (reference) lamp of the type specified by the manufacturer shall be used, it shall be supplied with electric current at a voltage such that it produces the flux prescribed for the tests corresponding to its type.

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*Specification for glass lenses for automobile headlights (replaceable lamp type).

†General requirements for automobile lighting and signalling devices.

‡Specification for electroplated coatings of nickel and chromium on iron and steel (*first revision*).

4.4 The fog light shall produce on the sereen over a width of not less than 2·25 metres on both sides of the line *VV* a symmetrical cut off approximately sufficiently closely to the horizontal to enable adjustment to be performed with its aid.

4.5 The fog light shall be so directed that the cut off on the screen is 500 mm below the line *hh*.

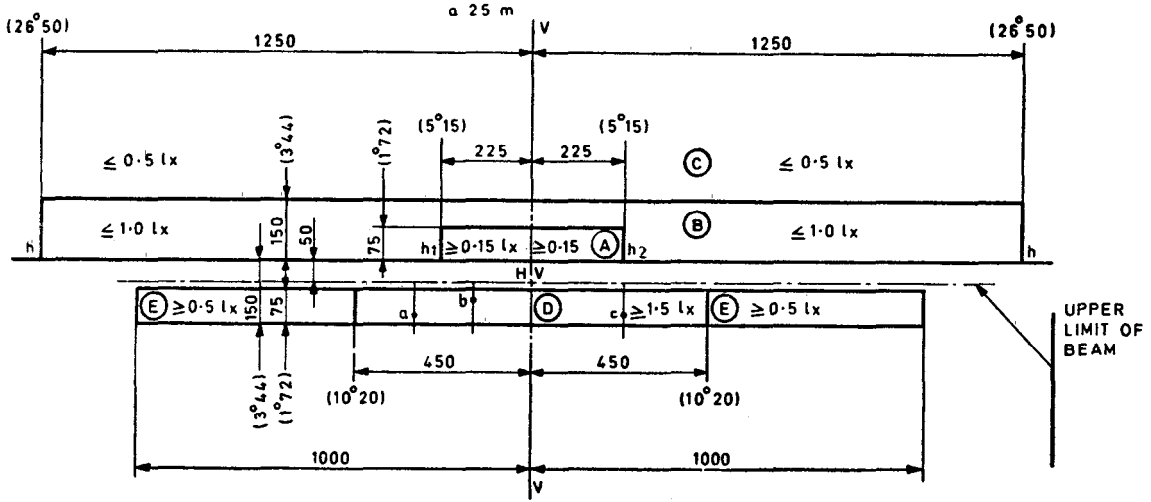
4.6 When so adjusted, the fog light shall meet the requirements set out in **4.7**.

4.7 The illumination produced on the screen (*see* Fig. 1) shall meet the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR ILLUMINATION

ZONE	POSITION ON MEASURING SCREEN, ZONE LIMIST	ILLUMINATION REQUIRED IN LUX
(1)	(2)	(3)
On the line *hh* between Points h_1 and h_2	225 cm (5°15) on both sides of line *VV*	$\geqslant 0{\cdot}3$
A	225 cm (5°15) on both sides of the line *VV* and 75 cm (1°72) above *hh*	$\geqslant 0{\cdot}15$ and $\leqslant 1$
B	1 250 cm (26°5) on both sides of the line *VV* and 150 cm (3°44) above *hh* including hh (except zone *A*)	$\leqslant 1$
C	1 250 cm (26°5) on both sides of line *VV* and starting from 150 cm above *hh*	$\leqslant 0{\cdot}5$
D	450 cm (10°20) on both sides of line *VV* and comprised between the parallels to *hh* respectively situated 75 and 150 cm below *hh*	On each vertical line in this zone there shall be at least one point (*a*, *b*, *c*) where the illumination is $\geqslant 1{\cdot}5$
E	From 450 cm (10°20) to 1 000 cm (21°45) on the both sides of zone *D* and comprised between the parallels to *hh* respectively situated 75 and 150 cm below *hh*	On each vertical line in this zone there shall be at least one point where the illumination is $\geqslant 0{\cdot}5$

NOTE — The illumination shall be measured either in white light or in coloured light as prescribed by the manufacturer for use of the fog light in normal service. No variations in illumination detrimental to satisfactory visibility shall exist in either of the zones *B* and *C*.



HV — point of intersection of lines *hh* and *VV*

All dimensions in centimetres.

NOTE — The figures following the degree sign are one-hundredths of a degree.

FIG. 1 MEASURING SCREEN

4.8 The screen illumination referred to in **4.7** shall be measured by means of a photo cell having a useful area comprised within a square of 65 mm side.

5. COLOUR

5.1 The colour of the light emitted shall be selective yellow or white in accordance with the colorimetric characteristics given in IS : 3105-1966*.

6. MARKING

6.1 Each fog light in accordance with this standard shall be permanently and legibly marked, in such position as to be clearly visible when the unit is mounted on the vehicle with the name, trade mark or other means of identifications of the manufacturers and type of lamp to be used.

6.1.1 The fog lights may also be marked with ISI Certification Mark.

NOTE 1 — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

7. TESTS

7.0 Classification of Tests

7.0.1 *Type Tests* — The following shall constitute type tests:

a) Visual examination (*see* **7.1**),
b) Vibration test (*see* **7.3**),
c) Test for salt spray (*see* **7.4**),
d) Dust test for seals and gaskets (*see* **7.5**),
e) Heat resistance test (*see* **7.6**),
f) Thermal shock resistance test (*see* **7.7**),
g) Moisture test for adequate drainage (*see* **7.8**),
h) Insulation resistance test (*see* **7.9**),
j) Photometric test (*see* **7.10**),
k) Colour test (*see* **7.11**),
m) Test for resistance to oil (*see* **7.12**),

*General requirements for automobile lighting and signalling devices.

n) Warpage test for units with plastic lenses (*see* **7.13**), and

p) Plastic stability test for units with plastic lenses (*see* **7.14**).

7.0.2 *Criteria for Approval* — Nine samples shall be submitted for testing together with the relevant data. The testing authority shall issue a type approval certificate if the fog lights are found to comply with the requirements of tests given in **7.0.1**.

7.0.3 After visual examination, all the samples shall be subjected to insulation resistance test (*see* **7.9**), photometric test (*see* **7.10**) and colour tests (*see* **7.11**). They shall then be subjected to the tests in the following manner:

Vibration test	1 sample
Test for salt spray	2 samples
Dust test for seals and gaskets	2 samples
Heat resistance test	1 sample
Thermal shock resistance test	1 sample
Moisture test for adequate drainage	2 samples

For fog lights with plastic lenses, one additional sample each is to be subjected to resistance to oil test, warpage test and plastic stability test.

7.0.4 In case of failure of one or more type tests, the testing authority may call for fresh samples not exceeding twice the number of original samples and subject them to the test(s) in which failure ocurred. If, in repeated test(s) no failure occurs, the tests may be considered to have been satisfied.

7.0.5 *Filament Lamps Used in the Test* — The lamps to be used for photometric tests of fog lights shall conform to IS : 1606-1966* with tolerances not exceeding half of the production limits.

7.0.6 *Acceptance Tests* — The acceptance tests shall constitute:

a) visual examination (*see* **7.1**),

b) thermal shock resistance test (*see* **7.7**), and

c) photometric test (*see* **7.10**).

NOTE — The number of samples for acceptance tests shall be as agreed upon between the purchaser and the manufacturer. However, the recommended plan of sampling is given in Appendix A.

7.0.7 *Routine Tests* — The following shall constitute routine tests:

a) Visual examination (*see* **7.1**), and

b) Electrical continuity test (*see* **7.2**).

*Specification for automobile lamps (*first revision*).

7.1 Visual Examination — Fog lights shall be examined for finish, workmanship and electrical contacts. They shall be checked for their overall and fixing dimensions wherever they are specified.

7.2 Electrical Continuity Test — Fog lights shall be examined for electrical continuity by a suitable continuity tester.

7.3 Vibration Test — The test shall be conducted as specified in **5.1.5** of IS:3105-1966*. At the end of the vibration test, the light unit shall be tight and it shall not rattle.

7.4 Test for Salt Spray — This test shall be conducted as specified in **5.1.7** of IS:3105-1966* and is applicable only when completely assembled in a fixture comparable to mounting on vehicle for realistic severity of test.

7.5 Dust Test for Seals and Gaskets — This test shall be conducted as specified in **5.1.8** of IS:3105-1966*.

7.6 Heat Resistance Test — A filament lamp of same wattage as used for photometrie tests which has been cleaned by wiping and by operating it outside the unit for 5 minutes shall be fitted to a sample unit without the filament lamp envelope being touched. The unit shall be run with the filament at 7, 14 and 28 V for rated voltages of 6, 12 and 24 V respectively in its normal operating position for one hour in an ambient temperature of approximately 27°C. After the test there shall be no sign of deterioration of the reflecting surface.

7.7 Thermal Shock Resistance Test — A sample unit shall be run for not less than 15 minutes with the filament at 7, 14 and 28 V for rated voltages of 6, 12 and 24 V respectively in its normal operating position in an ambient temperature of approximately 27°C. It shall then be disconnected and immediately plunged into water at 5°C below the ambient. No cracking or fracture of the lens shall occur.

7.8 Moisture Test for Adequate Drainage — This test shall be conducted as specified in **5.1.9** of IS:3105-1966*.

7.9 Insullation Resistance Test

7.9.1 The insulation resistance shall be measured by the application of a dc voltage of 500 V for one minute.

7.9.2 The insulation resistance value, thus measured, shall be not less than one megohm.

7.10 Photometric Test — *See* **4.7.**

7.11 Colour Test — The colour of the light emitted shall be selective yellow or white in accordance with the colorimetric characteristics given in IS:3105-1966*.

*General requirements for automobile lighting and signalling devices.

7.12 Test for Resistance to Oil — The test shall be carried out as specified in **5.1.6** of IS:3105-1966*.

7.13 Warpage Test for Units with Plastic Lenses — The test shall be carried out as specified in **5.1.10** of IS:3105-1966*.

7.14 Plastic Stability Test for Units with Plastic Lenses — The test shall be carried out in accordance with **5.1.11** of IS:3105-1966*.

APPENDIX A

(*Clause* 7.0.6)

RECOMMENDED PLAN OF SAMPLING

A-0. GENERAL

A-0.1 If statistical quality control techniques have been used for production control such test results and relevant charts may be made available along with the material supplied to enable the purchaser to judge the acceptability or otherwise of a lot. In case such information is not available, the procedure given in **A-1.1** to **A-3.1** is recommended for judging conformity of a lot with the requirements of this specification.

A-1. SCALE OF SAMPLING

A-1.1 Lot — In any consignment, all the fog lights of the same size and from the same batch of manufacture shall be grouped together to constitute a lot.

A-1.2 The number of fog lights to be selected from a lot shall depend upon the lot size and shall be in accordance with col 1 and 2 of Table 2.

TABLE 2 SIZE OF SAMPLE AND CRITERION FOR CONFORMITY

Lot Size *N*	Sample Size *n*	Permissible Number of Defectives
(1)	(2)	(3)
Up to 200	15	1
201 „ 300	20	1
301 „ 500	30	2
501 „ 800	40	3
801 „ 1 300	55	3
1 301 and above	75	4

*General requirements for automobile lighting and signalling devices.

NOTE — The sampling plan recommended here assures that lots with 3 percent or less defectives would be accepted most of the times and lots with defectives above 20 percent would be rejected most of the times.

A-1.3 These fog lights shall be selected at random. In order to ensure randomness, the following procedure may be adopted.

Arrange the fog lights in a systematic manner and starting from any fog light count them as 1, 2....., etc, up to r, r being equal to the integral part of N/n, N being the lot size and n the sample size. Every rth fog light shall be included in the sample.

A-2. NUMBER OF TESTS

A-2.1 All the fog lights selected under **A-1.2** shall be subjected to acceptance tests given in **7.0.6**.

A-3. CRITERION FOR CONFORMITY

A-3.1 A lot shall be considered as conforming to this specification, if the number of fog lights out of those tested, failing to satisfy the requirements of any one or more of acceptance tests, does not exceed the corresponding number given in col 3 of Table 2.

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